



EXPRO National Manual for Projects Management

Volume 6, Chapter 3

General Engineering Procedures



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General Engineering Procedures

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1.0 PURPOSE

The purpose of this document is to define the Entity's responsibilities with respect to the use of the General Engineering Procedures and other templates, checklists, etc. included in the National manual for Project Management (NMPM) on its projects. This document also defines the order of precedence in the event of conflict between the applicable design codes/ standards and other documents issued by the Entity for use by Architecture & Engineer (A/E) on its projects.

2.0 SCOPE

The requirements defined in the MPWB including this chapter shall be used by the Entity in the design of all its infrastructure projects in the Kingdom of Saudi Arabia. These requirements shall be employed by the Entity on all its projects whether the design is performed by the A/E Contractor, Engineering, Procurement and Construction (EPC) Contractors or Specialty Design Contractors.

3.0 DEFINITIONS

Term	Description
A/E	Architect & Engineer
BEDD	Basic Engineering Design Data
DBR	Design Basis Report
Entity	A Saudi Government organization which is responsible for the delivery of government funded infrastructure construction projects.
EPC	Engineering, Procurement and Construction
ISO	International Organization for Standardization
NMPM	National manual for Project Management

4.0 REFERENCES

1. EPM-KE0-PR-000002 - Design Review Procedure
2. EPM-KE0-PR-000003 - Calculations Procedure
3. EPM-KE0-PR-000004 - Engineering Close Out Procedure
4. EPM-KE0-PR-000006 - Development of Service Requisition - Procedure
5. EPM-KE0-PR-000001 - Development and Implementation of Design Standards Procedure
6. EPM-KE0-PR-000009 - Design Change Notice Procedure
7. EPM-KE0-GL-000014 - Codes, Standards & Reference
8. EPM-KE0-GL 000015 - Project Submission Standards and Requirements
9. EPM-KE0-GL 000016 - General Design Guidelines
10. EPM-KE0-TP-000020 - Design Change Notice Template
11. EPM-EN0-PL-000001 - Technical Standardization Plan
12. EPM-KE0-TP-000029 - Calculation Sheet Template
13. EPM-KE0-TP-000009 - General Engineering Procedures

5.0 RESPONSIBILITIES:

- ENTITY: Following are the Engineering Responsibilities of the Entity in the design of its projects:
 - Define the Engineering scope of work for each of its projects
 - Oversight and general coordination of the A/E contractor's work to align with the requirements defined in the Scope of Work
 - Review and approval of the design documents produced by the A/E
- A/E: The Entity to ensure the Scope of Work of engineering services holds A/E responsible for the following:



- Professional quality, technical accuracy, completeness, and coordination of the work in order that the Entity may rely upon the work for subsequent procurement, construction, and implementation of the Project
- Coordination and cooperation with other project stake holders having interface with the Project. If required A/E shall work with other Entities to define and clarify project limits and coordination between interfacing work of other A/E's and Construction Contractors
- Perform necessary coordination including obtaining design approvals as necessary from third parties having jurisdiction/ interface with the project, e.g. Saudi Electric Company (SEC).
- If required conduct Project site walks to familiarize with existing site conditions against Project requirements and identify any site investigations required (site survey/hydrology/Geotech) before finalizing Design Basis Report
- Developing Basic Engineering Design Data (BEDD), Design Criteria as a part of the Design Basis Report (DBR). BEDD and DBRs are described in detail in MPWB, Volume 6, Chapter 6 (EPM-KE0-GL-000015) and Design Criteria in MPWB, Volume 6, Chapter 7 (EPM-KE0-GL-000016)
- Develop calculations, drawings, material take-off (MTO), etc. required to procure the material and construct the Project
- Incorporate safety in design (refer EPM-KE0-GL-000014) so as to reduce or eliminates hazards and the likely risks from hazards both during construction and operation phase of the Project
- Participate in Project's Risk Management activities and resolve design related actions identified in the Project risk register
- Review alternate proposals/ solutions from Construction and provide recommendation for Entity's consideration.

6.0 PROCESS

6.1 Document Submittals

The Entity shall define the engineering documents and data to be developed for each of its project and its requirement of review and approval. The Entity shall require the A/E to submit documentation progress at 10%, 30%, 60%, 90%, and 100% complete as defined in the Design Review procedure (EPM-KE0-PR-000002).

Refer to Section 6.3 of this document regarding General Engineering Procedures applicable on Entity's Projects.

6.2 Quality Management System

The A/E and their sub-Consultants shall establish and implement a Quality Management System (QMS) that complies with the International Organization for Standardization (ISO) 9001:2008 and an Environmental Management System that complies with ISO 14001:2004 and meets the minimum quality and environmental requirements set by the Entity. The systems shall be capable of demonstrating that all the quality and environmental requirements of the Contract are being complied with.

Mere third party registration of assessed capability (i.e. approval to ISO 9001:2015 and ISO 14001:2015 Standards) will not be considered sufficient to demonstrate that the minimum requirements set by the Entity has been satisfied. Such registration will, however, be considered as a significant contributing factor in assessing the capability of the A/E to meet the Entity's quality and environmental requirements.

6.3 Engineering Procedures

Table below lists the General Engineering Procedures to be used, as applicable, by Entity in the design of its projects.



General Engineering Procedures

SN	Name of The Procedure	Document No	To be used for
1	Design Review Procedure	EPM-KE0-PR-000002	For conducting internal and external design reviews at 10%, 30%, 60% and 90%
2	Calculations Procedure	EPM-KE0-PR-000003	Performing Engineering calculations, includes calculation templates
3	Development of Service Requisition - Procedure	EPM-KE0-PR-000006	Developing the scope for services for A/E or EPC Contracts
4	Development and Implementation of Design Standards Procedure	EPM-KE0-PR-000001	Defining the codes, standards, specifications for use on Projects
5	Design Change Notice Template	EPM-KE0-TP-000020	Changing the design document after it is issued for Construction
6	Engineering Close Out Procedure	EPM-KE0-PR-000004	formally closing A/E services contract
7	Technical Standardization Plan	EPM-EN0-PL-000001	Developing the cope for services for A/E for the development of Technical Standards

Refer to each procedure for its purpose, scope, responsibilities and the process of its use on Entity's Projects.

6.4 Order of Precedence for Technical Conflicts

The design shall be based on the Codes and Standards defined in the DBR. Refer to MPWB, Volume 6, Chapter 6, EPM-KE0-GL-000015 for the contents of DBR. In case of conflict between applicable codes/ standards, the A/E shall identify the conflict and seek the Entity's approval in writing for the resolution.

The general hierarchy or orders of precedence for conflict resolution for any Contract apart from seeking advice from the Entity are as follows:

- Saudi Arabian Building Codes
- Local Regulations
- Environmental Regulations, Safety and Security Directives (SSD), and relevant Environmental Impact Assessments
- International Codes and Standards
- Refer to the MPWB, Volume 5 (Procurement) for the order of precedence for Drawings, Specifications, Scope of Works, etc.

7.0 ATTACHMENTS

None.